

What Is Claimed Is:

1. An integrated circuit package, comprising:  
a heat spreader having a planar surface; and  
5 a thinned semiconductor die mounted on the planar surface of said heat spreader.
2. The package of claim 1, wherein said die is mounted on said heat spreader using a thermally conductive material.
3. The package of claim 1, wherein said die has a thickness of no more than  
10 100 $\mu$ m.
4. The package of claim 1, further including at least one build-up layer disposed on the heat spreader and said die.
5. The package of claim 4, wherein said at least one build-up layer includes a dielectric material to planarize exposed top surfaces of the heat spreader and the die.
- 15 6. The package of claim 4, wherein said dielectric material is formed by one of spin coating, curtain coating, slot coating, roll coating, squeegee application, and dry film lamination.
7. The package of claim 4, wherein said at least one build-up layer includes at least one conductive trace contacting at least one contact on said die.
- 20 8. The package of claim 7, wherein said at least one build-up layer includes at least two build-up layers, said at least two build-up layers including at least one dielectric layer disposed on at least a portion of the at least one conductive trace, and at least one second conductive trace extending through the at least one dielectric layer to

contact the at least one conductive trace.

9. The package of claim 1, wherein said die is made thin by at least one of plasma etching, chemical etching, grinding, and polishing.

10. The package of claim 1, wherein said die includes a metallization layer  
5 formed on a back side of said die.

11. The package of claim 10, wherein said die is attached by said metallization layer to a heat spreader by metal to metal diffusion bonding.

12. The package of claim 1, wherein said thermally conductive material includes one of silver, aluminum nitride, metal solder, resin, and epoxy.

10 13. A method of fabricating an integrated circuit package, comprising:  
mounting a thinned semiconductor die on a planar surface of a heat spreader.

14. The method of claim 13, wherein mounting includes mounting said die on to the heat spreader using a thermally conductive material.

15 15. The method of claim 13, wherein mounting includes attaching said die to the heat spreader by metal to metal diffusion bonding.

16. The method of claim 13, wherein said die has a thickness of no more than 100 $\mu$ m.

17. The method of claim 13, further including forming at least one build-up layer over the die and heat spreader.

20 18. The method of claim 17, wherein forming includes emplacing a dielectric material to planarize exposed top surfaces of the heat spreader and the die.

19. The method of claim 18, wherein forming includes forming at least one build-up layer that includes at least one conductive trace contacting at least one contact

on said die.

20. The method of claim 19, wherein forming includes forming at least two build-up layers, said at least two build-up layers including at least one dielectric layer disposed on at least a portion of the at least one conductive trace, and at least one  
5 second conductive trace extending through the at least one dielectric layer to contact the at least one conductive trace.

21. The method of claim 18, wherein said step of forming a build-up layer includes emplacing the dielectric material by one of spin coating, curtain coating, slot coating, roll coating, squeegee application, or dry film lamination.

10 22. The method of claim 13, wherein said die is made thin by at least one of plasma etching, grinding, polishing, and chemical etching.

23. The method of claim 13, further comprising:

forming a metallization layer on said die.

24. A method of fabricating an integrated circuit package, comprising:

15 providing a planar heat spreader;

mounting a plurality of thinned semiconductor dice on to a planar surface of said heat spreader to form a plurality of conjoined microelectronic packages; and

singulating said plurality of conjoined microelectronic packages by cutting through the heat spreader.

20 27. The method of claim 24, further including forming at least one build-up layer over top surfaces of the die and the heat spreader.

28. The method of claim 27, further including singulating said plurality of microelectronic packages by simultaneously cutting through said heat spreader and said

at least one build-up layer.

29. The method of claim 27, further including forming a set of contacts to connect to an external component, the external component including a motherboard.

30. The method of claim 29, further including singulating said plurality of  
5 microelectronic packages by simultaneously cutting through said heat spreader and said at least one build-up layer.

31. The method of claim 24, wherein mounting includes mounting the plurality of semiconductor dice on to the heat spreader using a thermally conductive material.

32. The method of claim 31, wherein mounting includes forming a diffusion  
10 bond.

33. The method of claim 24, wherein said die has a thickness of no more than 100um.